

October 7, 1949.

- A) Reversions of parents. Plate ca 10³/plate $\bar{\epsilon}$ or without single components.
 Purified cultures
- W1205:
 T(0): 11, 11, 13 37 tested
 all Lac - Malt +
 Hist 32, 33 18 tested on T(0) 7 prototrophs!
 Th. crowded $\bar{\epsilon}$ contaminants.

1195

T(0) 0, 0

Leuc. 7, 4

B) Crosses.

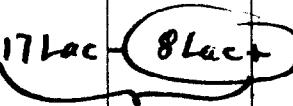
A 1189 x 1195

7 tested: all Malt +

4 Lac+ 3 Lac+

B 1189 x 1205 C 1195-1191 No prototrophs

all Malt as EM5Malt

17 Lac  8 Lac+ 
 25 Malt +

Are these Lac+ Malt+ recombinants?

October 14, 1949.

■ 1 ml (10x) per plate. grown in Penassay overnight and washed. Specimen T(0); hist; thiomine.

O 8, 11

H 448, 380.

T 15, 14

Test T colonies for phototrophy

25: all phototrophic!

Oct. 17, 1949.

9 AM. Reinoculate from overnight Pemascay cultures 1 ml / 10.

Slow to 3 PM +

A W 1177^{SR} B W 1217^{B2R} C W 1177 + W 1217

Use nutrient agar + 100 µ/ml SR + 130 µ/ml Azide (= 1/500)

- 1) Droulate 2 ml culture / 50 ml nutrient agar medium. Pour 1 ml / plate
- 2) " 5 ml "

100 colonies picked from C, streaked on E 143 Lac. 34 Lac+ : 66 Lac-

A1 Eventually produces numerous small colonies, especially when evenly dispersed. 13 countable colonies / 4 plates.
 $= 13/2 \times 10^9$.

A2 " " very minute | " " 15 plates.

B1 4 plates. No colonies. Clear plates!

B2 5 plates 1 colony. Clear plates. Pick this colony
and streak out on the same plate, as well as E 143 Lac.

C Many minute colonies. 98, 121, 98, 91 (add 'lone picked')
 $= 102 / \text{plate average}$

$$= 500 / 2 \times 10^9$$

Lact 34. 28 were Mal- Xyl- Mtl- -

Xyl+ Mtl+ Mal- #2

Xyl+ Mtl- Mal- #4

Xyl+ Mtl+ Mal+ 1

630a

lac-66.

- a) 1 Xyl+Mtl+ Mal+
 2 Xyl+Mtl+ Mal-
 1 Xyl-Mtl- Malt+

b)

1

- 1 Xyl+Mtl-Mal-

Total:

	Lac+	Xyl	Mtl	Mal	TS	Nutr separ
1	-	-	-	-	16R, 4S
2	-	+	-	-	R	B+
3	-	+	+	-	1S; 1R	M-
4	-	+	+	+	1S; 1R	1M; 1B,
5	-	-	-	+	S	M-
6	+	-	-	-	= S	
7	+	+	+	-	2 S	M; +
8	*	+	+	-	S	2+; 1B; 1L
9	+	+	+	+	S	
①	+	+	+	+	S	M-

Linkages.

Xyl+ / lac-	:	5 / 61
Xyl+ / lac+	:	6 / 28
Xyl+ / Mtl+	:	6 / 8
Xyl+ / Mtl-	:	3 / 12
Mtl+ / Xyl+	:	3 / 9
Mtl+ / Xyl-	:	1 / 91

Test 10 type 1 for nutr., phage
samples of all other types

Complete phage tests
nutritioinal

6305

10/25 - 6/1949.

10 bac- - tested (all T₅'s)

1	+
2	B,
3	T
4	+
5	TB,
6	TB,
7	TB,
8	n.g.
9	+
10	+

* useful?

Test bac- ... V_i^R formulation

1	B,
2	B,
3	TLB,
4	TLB,
5	TLB,
6	TLB,
7	B,
8	B,
9	TLB,
10	T
11	TLB,
12	T
13	TBB,
14	TBB,
15	TBB,

40 -
2X -
TB -
TB -

Oct 17, 1949

A 1195
 B 1205
 C 1222
 D 1222 x 1195 (grown together overnight)
 E 1222 x 1205 "

10/21/49:

A	4	T(0)	3 EMS.	2 colonies.
B	3	"	3 "	14 cols.
C	3	"	4 "	0 cols.
D	8	"	10 "	1? Lac+ colony as EMS
				10 colonies
E	5	"	5 "	5 T(0) 2 EMS Lac

Fermentation tests:

		Lac			
A	2	Lac - Salt + Malt + grows poorly			
		met EMS Lac			
B	9	Lac - Salt + Malt +			
C	-	No fermentation			
			1	-	x
			2	-	x
			3	+	x
			4	+	x
			5	+	x
			6	-	x
			7	-	x
			8	-	x
			9	-	x
			10	+	x
		E	1	-	x
			2	-	x
			3	+	x
			4	+	x
			5	+	x
			6	-	x
			7	-	x
		Parents {	.	+	-
				*	grows poorly on EMS Lac

October 24, 1949

Stocks on galactose

D

1								
2								
3								
4								
5								
6								
7								
8	Lac+	Mal-	Gal-					
9	Lac-	Mal+	Gal+					
10	Lac+	Mal-	Gal-					
	Lac-	Mal+	Gal+					
D				(P)				
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
E	Gal+	Lac-	Mal+					
1	"	"	"					
2	"	"	"					
3	"	"	"					
4	Gal+	Lac-	Mal+					
5	Gal+	"	Mal+					
6	Gal+	"	Mal+					
7	Gal+	"	Mal+					

No definite recombinants in E.

In D, # 1, 2, 6, 7, 9 are Gal-Lac-Mal+

which is a new combination!

These are partly mucoid and flagrid!

Renumbered 631: 1-5

Time of prototroph formation

634

10/25/49.

58-161 x W677. Spread .1 ml on T(B) plates 11 AM.

At stated times, respread with .1 ml saline. Count at
18 hours:

	Time	Numbers of prototrophs / plate	M	(m.)
0	11 AM	0	132	211
1	12 th PM	170, 202, 207, 213	198	
2	2 ³⁰	228, 158	193	
3	3 ²⁰	346, 113 (sic!), 380, 307	286	
4	4 ⁴⁰	265 110 240 181	199	
5	5 ³⁰	133, 409, 143	262	

New coli strains-- crosses

634

October 26, 1949.

First prepare inocula overnight. Then mix. 1 ml inocula, grow together 36 h.

Wash and plate on T(0).

A. 1117	B. 1135	C. 1197	D. 1222	E. 1222+466	F. 1222 + 477	G 1222+1117
0,0,0	1?0,0,0,	1?,0,0	0,0,1	6,1,3,2,3	1,0	0-----

H. 1222+ 1197 I. 1222 + 1135.
 0000000 0000000

W-1222 is Val- ArgGlut- Mal-Gal-Lact Other stocks are Lac-.

Yields (per plate, 3 days) See above

Note prototrophs on E (W-466[K-12]) x W-1222. Streak out on EMB Lac to purify

and test:

	Lac	Gal	Mal	Sucr	T5
W-466	-	+	+	-	S
W-1222	+	-	-	+s	R

1	+	-	-	+	R	P
2	+	-	+	+	S	X
3	+	-	+	+	S	Z
4	+	-	-	+	R	P
5	+	-	-	+	S	X
6	+	-	-	+	R	P
7	+	-	-	+	R	P
8	+	-	-	++	R	P?
9	+	-	-	+	R	P
10	+	-	-	+	S	X
11	+	-	-	+	R	P
12	X	-	-	+	R	P
13	X	+	+	++	R	X
14	+	-	-	+	R	P

Numerous recombinations! (at least 5)

Try 1113, etc. x 677, etc.

October 25 "B" 1949.

W 1217 x W-677 on Lac EMS. Good yield. Pick 100 Lac+ and streak out on
Lac EMB for Lac^{r/s}. 14 Lacy found. [All were lambda+ /518]

Reisolate to EMS Lac. 635-1 and 635-9 streaked out, and Lac- and + segregants
isolated. Test on NA + Az. : (NA controls all +)

635 -1 -8

5 Lac- 1r 4s 2r 3s
3 Lac+ 5 r 0s 4r 1s
4 Lacy all r (segregants!) all r.

Both these cultures, therefore, are segregating for Az r/s.

Note totals:

Lac- 3:7 Lac+ 9:1 indicating linkage of Az to Lac, with frequent
crossovers.

Restest diploids on synthetic medium.

Oct. 25 1949 "C"

58-161 x 677. EMS Mal. Look for Mal+/- sectored prototrophs.

7 found. Streak out on EMS Mal to separate components.

from several hundred.

Attest.

	Mal	Lac	Xyl	Mtl	TS
1	+	-	++	--	SS
2	+	-	- -	+ -	SS
3	+	-	++	--	SS
4	+	+	- -	++	RR
5	+	-	- -	- -	SS
6	+	-	+-	+-	SS
7	+	-	+-	+-	SS

No. 4 is an error. No. 6-7 not especially remarkable.

In other, possibility of Mal- recessives must be considered.

Nov. 7, 1949.

A. 1235 x 1239

B. 1243 x 1239

C. 1238 x 1236

D. 1238 x 1242

EMS Lac B₁ Crosses by NZ

- A) heavy - background 20 small +/pl
 B) about 200 large +/pl - indistinct from bckg
 C) Heavy background 200+ several -, many intermediates
 D) Heavy bckg no - many large +

100 from each to EMB Lac to look for Lac v

Suturing on EMS Lac also observed.

A [I] Lac v Mal-

B [I] Lac v Malt+

Picks out single colonies of Lac_r from B for mut. tests: (T, L)

1	A ₁	+ only
2	A ₁	+
3	A ₁	+, -
4		

	Lac-	Lac+
1	(T)L	T
2	(T)L	T
3	(T) _{PROTOPROTH}	T
4	(T)L	T
5	(T)L	T
6	(T)L	T✓
7	L	T
8	L	T
9	L	T
10	L	T

No 3 crossonees.

Test streak #3 Lac-

November 10, 1949.

Repeat 637

- A 1235 x 1239 dilute, use 1 ml = suspension/plate
B 1243 x 1239 EMS Lac Add B, to susp.
C 1235 } Turbid!
D 1243 } Controls Turbid!
E 1239 } Clear.

Most plates with background much too heavy! Pick 120 Lac+ from B and look for lacy. 2 ?? Restreak on EMS lac; Mal.

None Mal^v.

Dye resistance mutants for outcross.

639

November 13, 1949

Grow K-12, W1113 and ~~W1115~~ in Peumosoy aer. overn.

W1113/Sr and K12/A₂ found. No K-12/Sr noted
either in. Ca $\pm 2 \times 10^9$ ea. tested.

Keep as W1297-1244.

Mg effects on recombination

640

November 13, 1949.

EP13 brookite 1:5.

8+ P13 Wash w/1217 and w/1177. Mix saline and plate on:

1) T(0)

2 Davis medium

3 " " + .1ml MgSO₄ Molar. Spread

4. " " " drop incenter of plate for diffusion effect.

643

K12 x W113
with drug resistance

Nov. 23, 1989

From overn. cultures, take 1ml each of 1244 and 1247 into Perma-Say
10 AM.

A) 7³⁰ PM. Plate 2 ml into 4 plates Nutr. Agar (+A2 + Streptomycin) to
select possible recombinants

B 12³⁰ PM 11/24. 5 ml / 50 ml agar in 4 plates

c. do. 2 ml " "

11/25/49.

Pilot run to search for liver extract requiring mutants.

X-12 subjected to penicillin selection in Y2 broth, then plated on same + liver extract. Colonies tested on T(0); EM3Lac; Y2+L.E. No L.Ex. differentials found, but 6/103 tested failed to grow on T(0) or first test. Retest from EM3Lac.

[1 Lac- also noted. Strain out and test purified culture on glucose in EM3Lac platings. Glut]

4/6 grew on T(0) this test. 1 gave a few colonies on T(0)
tests. 1 did not grow on T(0). Run down.

→ AS; HC; Y.Lac.

Nov 20 ff. 1959

		pp.	Yields colo.	
A.	W466 x 1279	3	0	
B.	478 x 1113	6	10-20/	Lysis at random
C.	* 1153	6	2	
D.	* 1156	7	24*	Mostly suc-
E.	* 1159	6	#10/	Lysis 4
F.	* 1160	6	4	

In streakings, a "lytic?" effect of Suc+ on suc- was noted. On verification, W1156 was found to lyse W478, indicating a lysogenic phage! active on K-12, even though $\lambda+$.

Test purified (streaked on EMB Suc+) isolates on Suc, Lac, T5, T6:

B: 12 - all Suc+ Lac+ T6^R T5^R

C 2 " " "

E 4 " " "

R 4 " " "

D 24: 23 Suc- Lac+ T6^S T5^S (ϵ^P)

No unselected recombinations

1 Suc+ Lac+ T6^R T5^R observed.

For these crosses, mutually resistant or mutually incompatible parents should be used! But try W1156 x W677.

Dominance at the S2 locus.

645

12/3/49.

W1246 x W1178. 10 plates. Only 5 colonies prototrophs
#Lac+3 is Lac+. Test segregants on SR.

all Mal-

#1 is V^R; others are V.^S

#3 appears partially streptomycin
sensitive, showing slow growth

In series B, Lac- 2, 3 are S^R; others are S^S

Streak out A3 from EMS Mal on EMB lac and EMB lac + SR 100.

UV effects on diploid

646

12/13/43 ff.

4 Mtl-colo. from H213 10^{-6} /3s. uv streaked on Mtl.

1,2 Mtl+ 3,4 Mtl-

10^{-1} /30s. uv.

1 Mtl+

2,3 Mtl-

4 Mtl v or ±.

→ Recruits possible Mtl colonies. = 646-1

None. Just Mtl+; Mtl-.

6461.

Quadrat H213.

12/6/49.

Spread 10^{-6} and 10^{-7} ml H213 (from EMSAC) suspensions on EMB Plat. Expose some to UV, 3 seconds.

10^{-7}	UV.	+	-	V	?	
	0	1	2	10		1
TOTAL	%	2	21	39	162	
10^{-6}	3	2	10	2		11
		5	5	3		12
		3	6	9		13
		5	4	4		14
10^{-7}	3	1	7	2		15
		1	1	1		
TOTAL		18	33	23		

10^{-6}	0	41	156		
	8	5	5		21
	3	70	70		22
		23			
	6	35	93		23
	3	25	76		24
	2	23	96		25.
		22	147	491	

Re-examine 7-0.

1	1	3	10	
2	0	2	13	
3	1	9	9	
4	0	5	11	
	2	19	43	

χ^2 :	2	21	39	62
	18	33	23	74
	20	54	62	136

6466.

 10^{-1} 8sec.

	+	-	v
31	6	16	26
32	2	16	22
33	2	22	16
34	0	14	10
35	5	15	10
36	7	11	15
37	1	6	13
38	4	12	19
39	5	13	39
	32	125	170

Some colonies ~~2~~ counted as +.

Unirradiated:

	+	-	v	Tot.
A	24	166	534	724
%	<u>3.3</u>	<u>22.9</u>	<u>73.8</u>	

B Irradiated 3 secs.
ca. 10^{-1} surv.

	18	33	23	74
	<u>24</u>	<u>44</u>	<u>31</u>	

C Irradiated 8 secs.
ca. 2×10^{-7}

	32	125	170	327
	<u>10</u>	<u>38</u>	<u>52</u>	

W1205 & W814

649

~~#~~ed from EMStac

130+

20-

No lac^u.

650

12/5/49

w1156 x w1257 "B".

student EMB Laz.

c w1157 x w1229 (11/15/49)

NEW YORK STATE COLLEGE OF AGRICULTURE
CORNELL UNIVERSITY

Wednesday
Dec 14

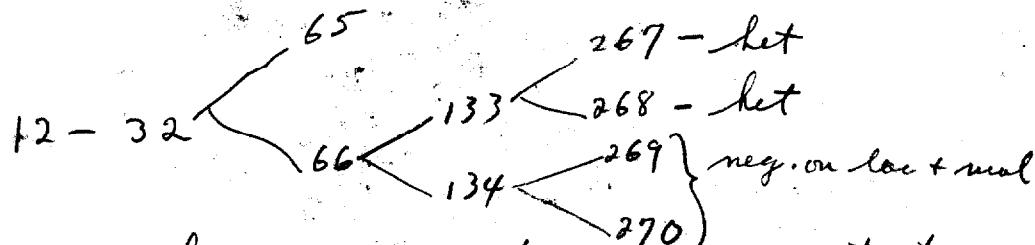
Dear Josh.

I have 4 series, 10, 11, 12, 13 with H206-1, a strain I have maintained from the original culture you sent.

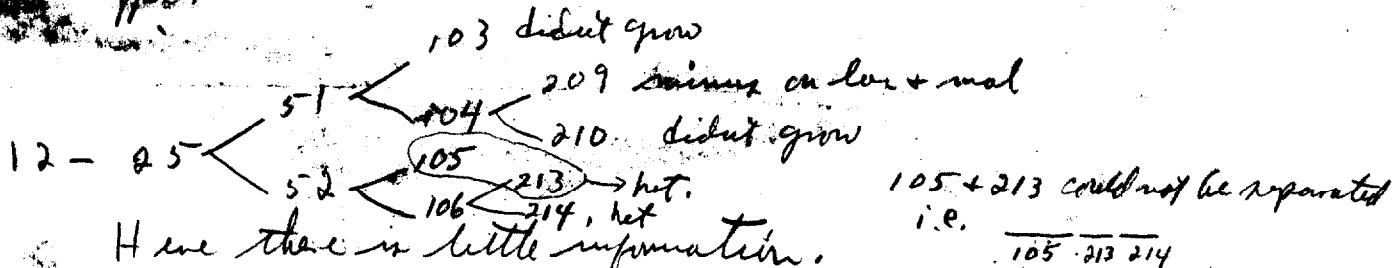
I don't have time to give the complete story but results so far are somewhat disappointing. I am sending a few cultures and the portions of the pedigree pertinent.

Series 10 + 11 with about 100 cultures in each gave no segregants. I thought I had a couple of ♀ segregants (have used H206-1 lactose mainly, maltose to a certain extent) but in every case could isolate a het colony.

In series 12, the only true segregants so far occurred. There are: 12-269, 12-270 and 12-209.



This indicates the same type of situation as before, i.e. no ergonomically important types.



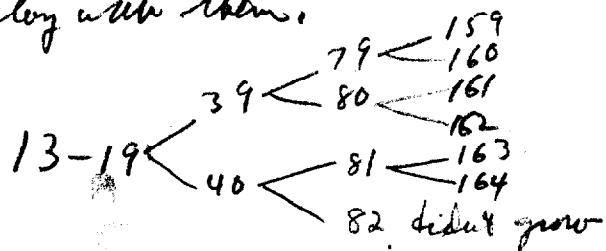
Here there is little information.

12-27 was a filamentous soil & could not further separate. It was largely minus lac, plus mal but there were a few hets also.

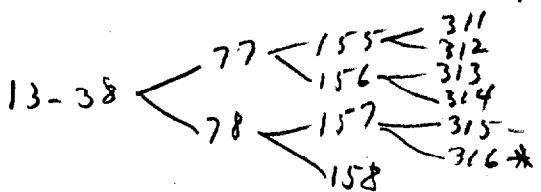
In addition 12-198 and 12-196 looked to be all positive on lactose but again I could find some small het colonies. These were in every case smaller colonies with a positive center & were not firmly mottled. But on streaking they proved to be ^{very faint} 13-316 and 3-163 behaved similarly, i.e. < 1% hets, no negatives, not lactose

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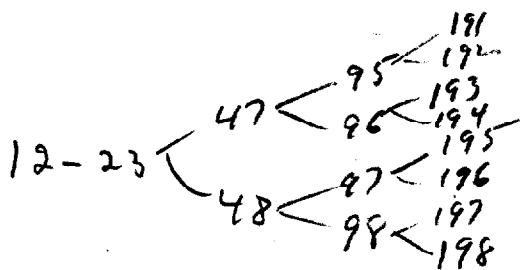
on lactose. It strikes me as curious that so many cells could be hets, segregate to positive very early and end up with a micro colony composed almost a few hit cells and no negatives. I wonder if all the positive cells are alike in other segregating characteristics. On replating 12-196 showed a few negatives but 12-198 showed no negatives among some 3000+ colonies. Similarly 13-316 and 13-163 showed a few negatives on replating. Probably in all these cases, a segregation occurred in the first division of the cell but the very unequal + to - ratio probably indicates also that complementary types are not found at the time of segregation. I'm sending some of these in case you want to play with them.



159, 160, 161, 162, 164 were typical hit cultures
163 as above indicated.



158, 311, 312, 314 were typical hets
313 mostly +, few minus + negatives.
316 mostly +, < 1% het + negatives.



all typical hets but 196 + 198

I have observed some unusual forms of cells in these cultures. Haven't yet worked your latest H-06, will do so next week. Sorry to be so sketchy but must leave for Washington

Sincerely
Mlap

NEW YORK STATE COLLEGE OF AGRICULTURE
CORNELL UNIVERSITY

Dear Jack,

4 Jan 1950

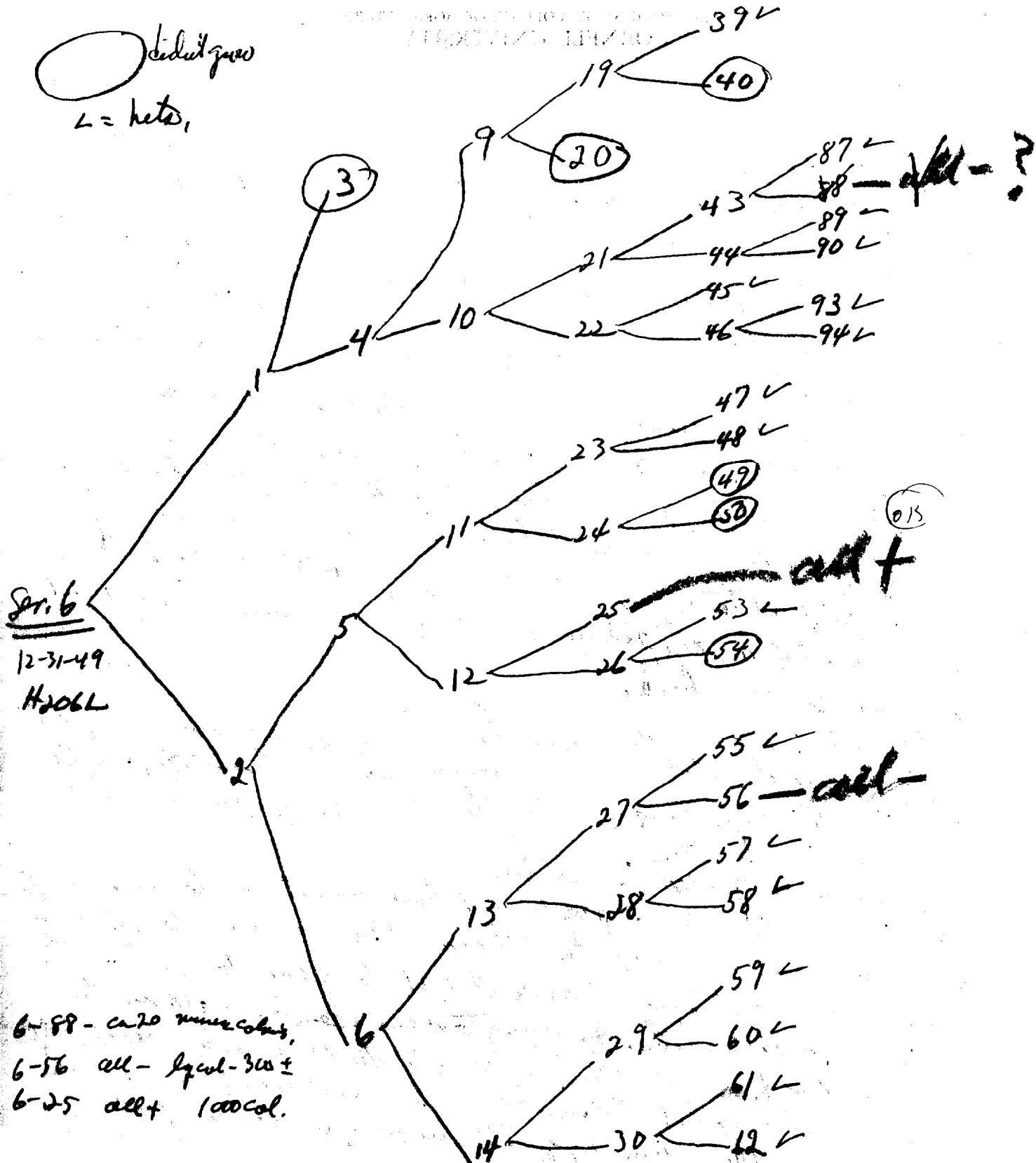
Gonna be so hurried in getting this off but at the moment life is a vgt race. So I'll try to give the pertinent information & get this off.

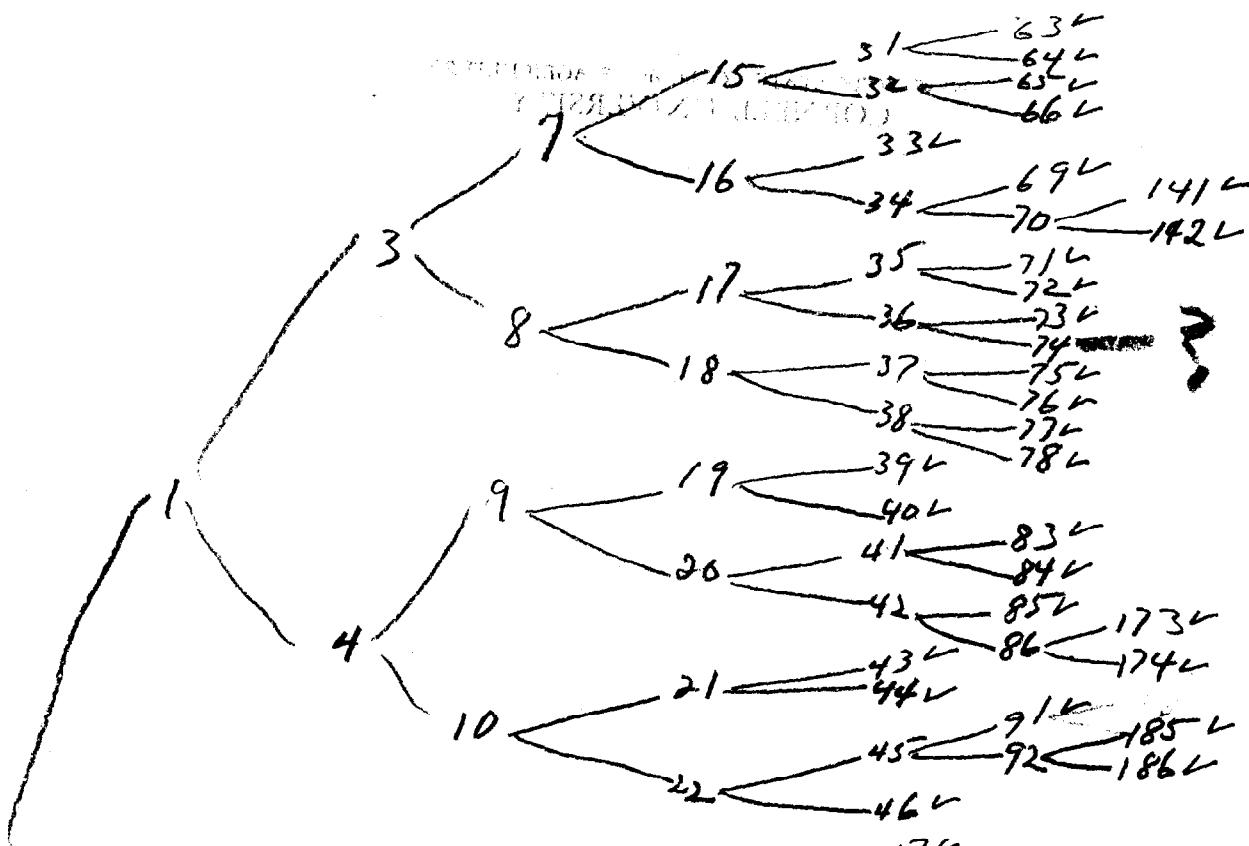
- 1- Sorry for the 1231-pedigree was your new culture of H206. This culture behaves differently in the moist chamber. Fewer filaments, fewer cells not growing, no "Y" forms & vegetations.
- 2- The numbers duplicate earlier pedigree. I started from 1 culture & started on H206 + three one # 5, 6 & 7. This is not good but not fatal. I numbered the ^{H206} others but don't have all my records here so will leave as is.
- 3- Some of the cultures gave black plates. I think they are indicated on the pedigree. They were isolated & sent along for you to check.
- 4- I picked 6 + colonies from the plate of 5-223 since they were nearly half the total colonies observed + on the chance they might be all alike and complementary to 5-223. You can do what you wish with them.
- 5- Cultures were tested on lactose.
- 6- I have seen the NIH people and have permission to do some of this down here. I'm going to do this the weekend to get my equipment. Initially, I think it best to send the cultures to you for classification. I'm going to send them in broth in the vials at present if they are too old to be easily classifiable I think I could do it down here but I don't want to kill the ~~goats~~ laying the golden eggs by moving in the ~~too fast~~.

So in a couple of weeks I hope to have some more cultures for you. Is it necessary to send them cimicid? I inoculate into 1/2 ml of broth. They can't grow too much to make classification difficult & I don't believe. Probably you'll have to send ~~rat~~ back occasionally - they are amazingly expensive.

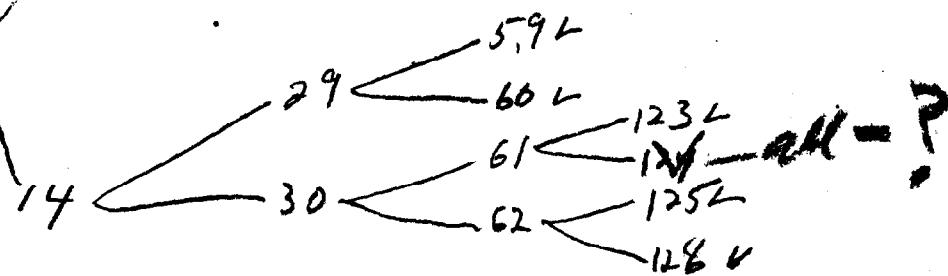
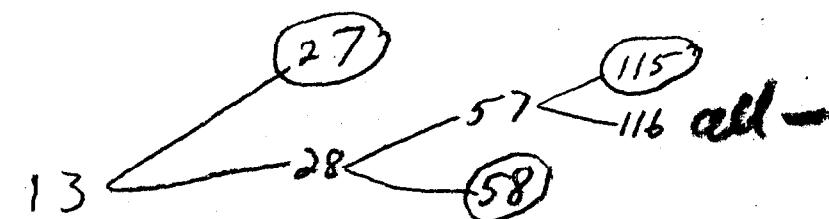
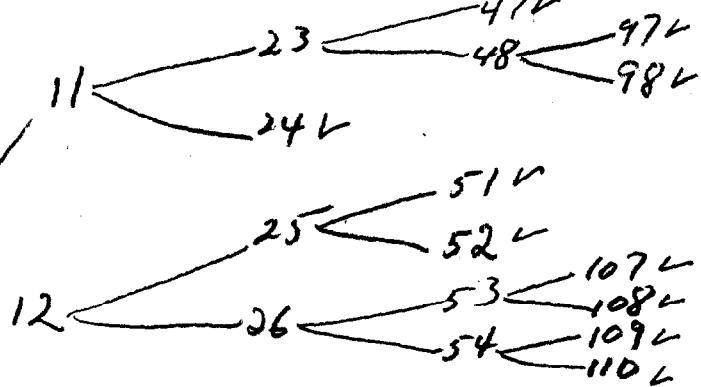
Very truly yours Alwyn

Odebut gro
L = hetero,





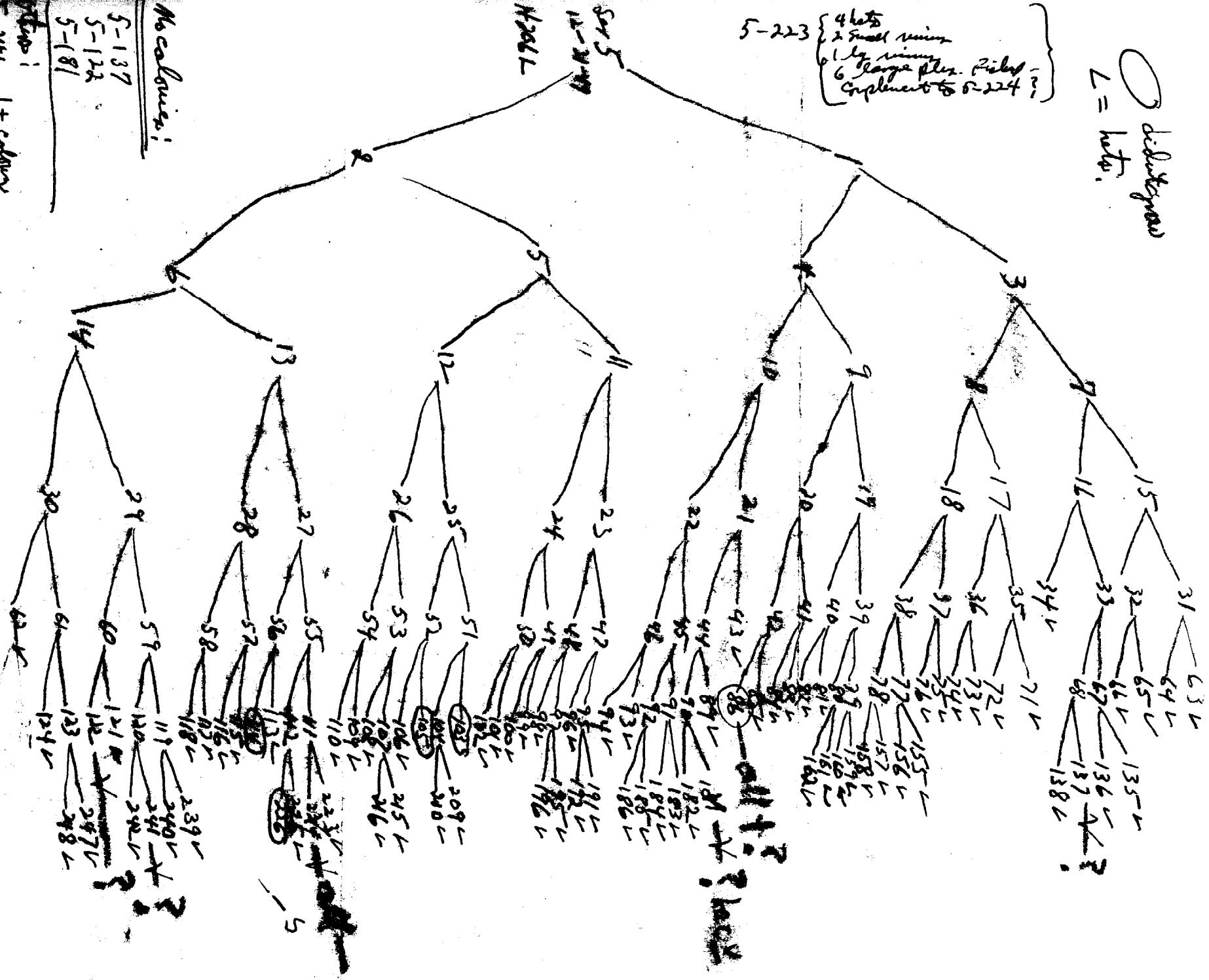
Set 7
12-31-49
#266L



.7-116 all -
lg. numer col.
7-124 25 all - colonies
9-74 no colonies.

O. diductipes
L = hata.

5-223
 4 lots
 2 small min
 1 big min
 6 large plus. Field
 complement to 5-224



Nomenclature:
 S-137
 S-122
 S-181

1 + colony

2000 ab + colony and - СОКИЕТ ГИЛАДЕВСКАЯ
 НОВАЯ ГРУППА СОВЕТСКОГО СОЮЗА

Hata + colonies.